

REMARKS

Reconsideration of the present application is respectfully requested. Upon entry of the actions requested in this paper, the pending claims will be those numbered 1-14 and 28-30. The applicants are appreciative of the examiner's recognition of the allowable subject matter embodied in claims 10-12. Claims 10 and 11 have been amended to place them in better form for allowance. Claim 14 has been amended to render the claim language consistent, and is believed to remove the antecedent basis problem that led to its rejection. It is further believed that claim 14 is now in condition of allowance.

Claims 1, 2, and 12 are rejected under 35 U.S.C. § 102(b) as anticipated by Colbert et al. Colbert et al., at page 30 lines 20-26, teaches that a method of cutting nano-tubes including the steps of irradiating the tubes with high mass ions, directed at the nano-tubes at energies of 0.1 to 10 GeV's. High mass ions include those of over 150 AMU's, such as bismuth, gold, and others. A weight of 150 AMU's is substantially higher than the weight of a nitrogen ion, or in the case of other embodiments of the present invention, hydrogen or argon. The applicants further observe that Colbert et al. teach that irradiating with high mass ions damages the tubes. Colbert teaches oxidative etching as a further technique of cutting nano-tubes.

Colbert et al. does not teach the applicants' invention, that is, the delivery of ions of relatively low mass to the surface of a nano-tube wherein said ions possess energy sufficient to produce dangling bonds along the nano-tube surface; and breaking the bonds by oxidation. This aspect of the invention is now clearly recited in claim 1, from which claims 2, 3, and 12 depend. This is also set forth in appropriate variation in independent claim nos. 6-9 and 13. Support is formed in the specification at page 13 line 11 to page 15 line 21.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Colbert et al. in view of JP 07-57682. The secondary reference does not cure the deficiencies of Colbert et al.

Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Yakobsen in view of Rezeku. Yakobsen discloses a nano-tube treatment in an elevated temperature range and further discloses subjecting the tubes to radiation, such as UV radiation, X-ray radiation, and combinations thereof. However, Yakobsen teaches a process in which the lattice structure of the nano-tubes is disrupted to form a dipole of dislocation cores, but not necessarily to cut the nano-tube into smaller pieces. Accordingly, the applicants' position is that Yakobsen is not directed to cutting nano-tubes, and in view of the aforementioned, teaches away from the present invention.

The teachings of Rezeku do not appear to be compatible with the teachings of Yakobsen. Rezeku teaches the creation of a dangling bond via irradiation. The person of ordinary skill, at the time the invention was made, would not be motivated to combine the teachings of the references, because they are incompatible with each other. Yakobsen teaches a technique intended to alter the lattice structure of the nano-tubes, whereas Rezeku teaches the formation of dangling bonds, via a technique that teaches away from the present invention.

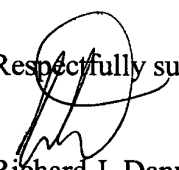
Claims 6-9 are rejected under 35 U.S.C. § 103 (c) as unpatentable over Yakobsen et al. in view of Colbert et al. These claims have been amended in a manner commensurate with the manner in which claim 1 have been amended to reflect that dangling bonds are formed via delivery of ions or atoms of relatively low mass at sufficient energy. Accordingly, it is submitted that these claims are in condition of allowance.

Claim 13 is rejected under 35 U.S.C. § 103 (a) as unpatentable over Jin et al. in view of Kaftanov. While Jin et al., in its figure 11 and the written description directed to same, would appear to disclose a cold cathode device, Jin et al. does not disclose supplying a gas, ionizing same, and bombarding the nano-tubes with the ionized gas in order to create dangling bonds. The method of truncating the nano-tubes disclosed by Jin et al. appear to employ very high-energy techniques that in fact evaporate at least some of the tubes. This method teaches away from the applicants' techniques. Kaftanov et al. teaches an entirely different technique wherein certain fibers in a bundle are somewhat separated at their tips via irradiation with ions.

Wherefore, based upon the foregoing, it is respectfully submitted that the present case is in condition for allowance, and an early reply to this paper is respectfully requested.

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Respectfully submitted,



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